

CLAIMS

1. A handheld pipette including:

a body portion shaped to fit in an operator's hand; and

5 a nozzle portion extending from a point on said body portion and at a downward facing angle θ of approximately 60° to 80° to a central axis of said body portion.

2. A handheld pipette as claimed in claim 1 wherein θ is approximately 70° to said central axis.

10 3. A handheld pipette as claimed in claim 1 wherein said nozzle angle θ is adjustable.

15 4. A handheld pipette as claimed in claim 1 wherein said nozzle angle θ is such as to permit at least one of the operator's wrist, elbow and shoulder to be in a substantially neutral position when the pipette is performing a pipetting operation.

20 5. A handheld pipette as claimed in claim 1 wherein said nozzle is designed to have a tip mounted to the end thereof, and wherein said angle θ for the nozzle is such that any tip mounting force is in a direction causing a major component of the force to be applied against and substantially perpendicular to a portion of the operator's hand grasping said body portion which is substantially between a second joint of the operator's fingers and a point slightly behind the operator's knuckles .

25 6. A handheld pipette as claimed in claim 1 including a hook extending from a point on said body portion which is sufficiently angularly spaced from the point from which said nozzle extends to permit the hook to fit over a selected portion of the operator's hand when the pipette is being held by the operation in a position for use.

30 7. A handheld pipette as claimed in claim 6 wherein said hook is adjustable to change at least one of the angle by which the hook is spaced from the nozzle, the height on the body portion for the point from which the hook extends and the angle of the hook relative to said central axis.

8. A handheld pipette as claimed in claim 6 wherein said hook is removably mounted to said body portion, said hook being replaceable with a hook of different size/shape to accommodate at least one of user preferences and different hand sizes.

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9. A handheld pipette as claimed in claim 1 including at least one button on said body which is operable to effect aspiration/dispensing of fluid through said nozzle.

10. A handheld pipette as claimed in claim 9 wherein said button extends from the top of said body to be operated by an operator's thumb.

11. A handheld pipette as claimed in claim 9 wherein said button is mounted on said body portion to be squeezed by an operator's hand.

12. A handheld pipette as claimed in claim 9 wherein said button is operated in a direction at a selected angle to said nozzle.

13. A handheld pipette as claimed in claim 9 wherein said button is ergonomically shaped to minimize contact pressure on the operator's hand when the button is operated.

14. A handheld pipette as claimed in claim 1 including a button on said body which controls ejection of a tip from said nozzle, said button being ergonomically shaped to minimize contact pressure on the operator's hand when the button is operated.

15. A handheld pipette as claimed in claim 1 wherein the position and angle θ of the nozzle are such that an end of the nozzle adjacent said body portion is closely adjacent the index finger of the operator when properly held.

16. A handheld pipette as claimed in claim 1 wherein said body has a stable base permitting said pipette to stand upright on a surface.

17. A handheld pipette as claimed in claim 16 wherein pipette parameters, including at least the angle θ of said nozzle to an axis of said body portion and a length of a tip affixed to said nozzle, are selected such that said tip does not touch said surface.

5 18. A handheld pipette as claimed in claim 1 wherein said body portion has a bottom which is removable at least in part to provide access to the pipette.

10 19. A handheld pipette as claimed in claim 1 including an adapter selectively mountable to said body portion, said adapter adjusting the size of said body portion to better fit operator hand size.

20. A handheld pipette as claimed in claim 1 including padding on at least a portion of said body portion.

15 21. A handheld pipette as claimed in claim 1 wherein portions of said pipette which come in contact with the operator's hand are ergonomically designed to minimize contact pressure for the operator's hand during operation of the pipette.

20 22. A handheld pipette as claimed in claim 21 wherein portions of said pipette which come in contact with the operator's hand are ergonomically designed so that contact pressure at no point on said pipette exceeds 14 psi.

25 23. A handheld pipette as claimed in claim 1 wherein said nozzle portion extends from a point on an upper section of said body portion.

30 24. A handheld pipette as claimed in claim 1 wherein said body portion is shaped and said nozzle portion is positioned such that when the pipette is held in an operating position, the nozzle portion is at an angle substantially perpendicular to the operator's forearm.

25. A handheld pipette including:
a body portion shaped to fit in an operator's hand;

a nozzle portion extending from a first point on an upper section of said body portion; and

a hook extending from a second point on the upper section of said body portion, said second point being angularly spaced by an angle ϕ from said first point.

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26. A handheld pipette as claimed in claim 25 wherein said hook is adjustable to change at least one of the angle by which the hook is spaced from the nozzle, the height on the body portion for the point from which the hook extends and the angle of the hook relative to a central axis of said body portion.

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27. A handheld pipette as claimed in claim 26 wherein the angular spacing between said nozzle and hook is adjustable.

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28. A handheld pipette as claimed in claim 25 wherein said hook is removably mounted to said body portion, said hook being replaceable with a hook of different size/shape to accommodate at least one of user preferences and different hand sizes.

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29. A handheld pipette as claimed in claim 25 including an adapter attachable to said hook to accommodate at least one of user preferences and different hand sizes.

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30. A handheld pipette including:
a body portion shaped to fit in an operator's hand; and
a nozzle portion extending from a point on said body portion and at a downward facing angle θ to a central axis of said body portion, said body portion being shaped and said nozzle portion being positioned such that when the pipette is held in an operating position, the nozzle portion is at an angle substantially perpendicular to the operator's forearm.

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31. A handheld pipette including:
a body portion shaped to fit in an operator's hand; and

- a nozzle portion extending from a point on said body portion and at a downward facing angle θ to a central axis of said body portion, said body portion being shaped and said nozzle portion being positioned such that when the pipette is held in an operating position, any force applied to mount a tip to the nozzle is in a direction causing a major
- 5 component of the force to be applied against and substantially perpendicular to a portion of the operator's hand grasping said body portion which is substantially between a second joint of the operator's fingers and a point slightly behind the operator's knuckles.

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